

REMARKS

Claims 1-14 are pending while claims 1-14 are rejected. Claims 1, 5, 8 and 12 have been amended, while claims 15 and 16 are new. Claims 7 and 14 have been cancelled, leaving claims 1-6, 8-13, 15, and 16 pending for consideration upon entry of the present amendment. No new matter has been added.

Drawings

The drawings are objected to under 37 CFR 1.83(a), as the drawings must show every feature of the invention specified in the claims. The Examiner states that therefore, the permanent magnets of claims 7 and 14 must be shown or the feature(s) canceled from the claim(s). A corrected drawing sheet (FIG. 2) in compliance with 37 CFR 1.121(d) and showing "permanent magnets" disposed between the claw pole segments 1, 2 is submitted herewith in reply to the Office action. Accordingly, it is respectfully requested that the objection to the drawings be withdrawn.

Claim Rejections - 35 USC §103

Claims 1-6 and 8-13 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Shiga (U.S. Patent No. 4,418,295) in view of Radomski (U.S. Patent No. 4,882,515). Applicants respectfully traverse.

Independent claims 1 and 8 have been amended to include the limitations of claims 7 and 14, respectively, thus mooting the rejection of claims 1-6 and 8-13 as being unpatentable over Shiga and Radomski, as neither Shiga nor Radomski admittedly discloses permanent magnets between each segment.

Claims 7 and 14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Shiga (U.S. Patent No. 4,418,295) in view of Radomski (U.S. Patent No. 4,882,515) as applied to respective claims 1 and 8 above, and further in view of Coroller (U.S. Patent No. 3,459,980). Applicants respectfully traverse.

The Examiner correctly admits that Shiga and Radomski do not disclose permanent magnets between each segment. However, the Examiner offers the disclosure of Coroller for teaching a double-claw-pole rotor for an AC automotive generator including permanent magnet 10 sandwiched between pole segments 14 and 15/15' and permanent magnet 10' between pole

segments 15/15' and 14' (Fig.2).

The Examiner aptly points out with respect to Coroller that use of permanent magnets 10, 10' eliminates the need to feed current to the dynamos (field windings) and results in a simplified construction which provides a high power alternative to alternators with dynamos (Col. 2, lines 25-41 and 64-72). The Examiner concludes therefore, that it would have been obvious to provide permanent magnets per Coroller for the rotor field windings per Shiga and Radomski since this would have eliminated the need to feed current to the field windings and thus simplifies construction.

Coroller specifically teaches an alternator that includes at least two permanent magnet rotor portions of drum-like configuration. (See Abstract) Permanent magnets having a shape which is approximately the same as that of dynamos of the same power are used as rotors. (Col. 2, lines 66-68) Each of the two rotors "consists of" a permanent magnet 10, 10' shaped into a right cylinder, ending with plane faces 11, 11' and 12, 12', respectively. (Col. 3, lines 53-59). Thus, Coroller teaches away from a coil winding of the dynamo and teaches use of a cylindrical permanent magnet block instead. Moreover, Coroller does not teach or suggest permanent magnets disposed between the claw pole segments 1, 2 (See first paragraph of page 4 of the specification as filed).

The magnets disclosed in the present application and illustrated in Figure 2 are located between the segment teeth of the rotor and are magnetized with the polarity shown. With magnets in such a location, the normal field coil (with DC excitation) is still used to control the output from the machine. This is very distinct and different from what Coroller (U.S. Patent No. 3,459,980), Radomski and Shiga teach or claim. In these prior art references, particularly in Coroller, the magnets are located where the rotor iron core is normally located without any wound field coil. In such a location, the magnetic excitation provided by the cylindrical shaped magnet is unshunted. Therefore if the electrical current demand on the machine is low, the magnetic strength from the magnet is still high which, if uncontrolled, would lead to excessively high, damaging voltages in the application that it is used in. The operation of the magnet must be countered by either a wound field coil that bucks this magnetic field strength, or by electronics attached to the outputs of the stator phase leads to open circuit the leads to reduce/eliminate current output.

In the disclosed configuration of the present application, however, the magnets are

naturally shunted. At a no load condition, the flux generated by the magnet will shunt internally through the iron structure of the rotor, not linking the stator iron, and thereby not producing output currents. The gains in output from the magnets come from the blockage of the excessive tooth-to-tooth flux leakage that normally occurs in the rotor and from the supplemental flux provided during normal current producing operation of the machine.

Neither Shiga, Radomski, nor Coroller, alone or in combination, teach or suggest, a rotor rotatable within said stator, said rotor including more than two flux carrying segments rotatably disposed on a rotor shaft in said housing, each segment having $P/2$ claw poles, wherein P is an even number and permanent magnets are disposed between each segment tooth of said each segment to enhance at least one of output and efficiency; a coil winding disposed intermediate said more than two flux carrying segments; and two fans each located adjacent to outbound segments defining said rotor and opposite each other disposed inside said housing and mounted concentric with said rotor shaft, as in claim 1 and similarly claimed in claim 8. Thus, claims 1 and 8, including claims depending therefrom, i.e., claims 2-6, 9-13, 15, and 16, define over Shiga in view of Radomski, and further in view of Coroller.

Conclusion

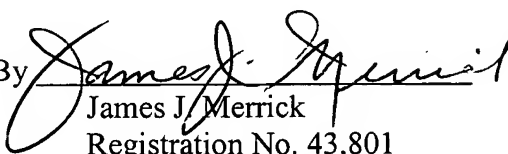
In view of the foregoing points that distinguish Applicants' invention from those of the prior art and render Applicants' invention not obvious, Applicants respectfully request that the Examiner reconsider the present application, remove the rejections, and allow the application to issue.

If the Examiner believes that a telephone conference with Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is invited to telephone the undersigned.

If additional charges are incurred with respect to this Amendment, they may be charged to Deposit Account Number 06-1130 maintained by Applicants' attorneys.

Respectfully submitted,

Cantor Colburn LLP

By 
James J. Merrick
Registration No. 43,801
Customer No. 23413

DATE: February 24, 2005
ADDRESS: 55 Griffin Road South, Bloomfield, CT 06002
PHONE: (860) 286-2929